IN THE SPECIFICATION

Please replace the paragraph beginning at page 2, line 33 with the following:

Generating a PTAT signal is commonly accomplished by operating two bipolar transistors at different current densities. It is well known that for two transistors operating at different current densities, the difference in base-emitter voltages is given by:

$$\cancel{\Delta VBE = kT/q\ ln\ J1/J2}\ \underline{\Delta V_{BE} = kT/q\ \mathit{ln}\ (J1/J2)} \qquad \text{Eq. (1)}$$

where k is Boltzman's constant, T is absolute temperature, q is the charge of an electron, and J1 and J2 are the current densities of the two transistors. (The expression kT/q is also known as the thermal voltage V_T.) Thus, the differential voltage is proportional to absolute temperature (PTAT). The current densities J1 and J2 are typically made unequal by operating the two transistors at the same current and making the emitter areas unequal. Alternatively, the same result could be obtained by setting the emitter areas equal and operating the transistors at unequal currents. Since this cell is based on the difference between the base-emitter voltages of two transistors, it is often referred to as a "ΔV_{BE}" cell.

Please replace the paragraph beginning at page 3, line 17 with the following:

The bases of transistors Q1 and Q2 are connected together, while the emitters are connected through resistor R2. Transistors Q1 and Q2 are loaded by resistors R_{C1} and R_{C2} which are typically selected to be equal. High gain amplifier A drives the bases of Q1 and Q2 so as to equalize the currents I_{C1} and I_{C2}. The emitter areas A1 and A2 of transistors Q1 and Q2 are unequal, and since $I_{C1} = I_{C2}$, the transistors operate at different current densities J1 and J2. Thus, according to Eq. (1), V_{BE} for the two transistors are unequal, and the difference voltage ΔV_{BE} appears across resistor R2. The current I_P through R2 is therefore given by $I_P = \Delta V_{BE} / R2$. However, since the current through both transistors is equal, the current through R1 is twice the current through R2, and the voltage V_{PTAT} across R1 is:

$$\cancel{VPTAT = 2\ (R1/R2)\ VT\ ln\ A1/A2}\ \underline{V_{PTAT} = 2\ (R1/R2)\ V_T\ \mathit{ln}\ (A2/A1)} \qquad \text{Eq. (2)}$$

Thus the voltage across R1 is proportional to absolute temperature since V_T is proportional to absolute temperature, i.e., $V_T = kT/q$.

Please replace the paragraph beginning at page 8, line 8 with the following:

The loop equation for the loop including the ΔV_{BE} cell may be written as follows:

$$IRx + V_{BE1} = V_{BE2} + (I_1+I)Rv \qquad \text{Eq. (3)}$$

where V_{BE1} is the base-emitter voltage of Q41, and V_{BE2} is the base-emitter voltage of Q42. Since V_{BE1} - V_{BE2} = ΔV_{BE}, and $\Delta V_{BE} = V_T ln(M)$, the equation may be rearranged as follows:

$$V_T ln(M) = V_{BE1} - V_{BE2} = IRv + I_1Rv - IRx \qquad \text{Eq. (4)}$$

As a convenient example, assume Rx = 2Rv - Rg and continue to rearrange:

$$\cancel{VTln(M) = IRv + I1Rv + I(2Rv - Rg)}\ \underline{V_T ln(M) = IRv + I_1Rv - I(2Rv - Rg)} \qquad \text{Eq. (5)}$$

$$V_T ln(M) = I_1Rv - IRv + IRg \qquad \text{Eq. (6)}$$

Since I and I_1 are effectively equal, the I_1Rv and IRv terms cancel, and it becomes apparent that the current I is determined by the parameter Rg:

$$I = V_T ln(M)/Rg \qquad \text{Eq. (7)}$$

Some further example values will now be discussed to provide more insight into the operation of the embodiment of Fig. 8, but the inventive principles not limited to any of these examples. If Rg < 2Rv, then Rx would be negative, so assume Rg = 2Rv. Rx then becomes zero. The voltage at the emitter of Q42 (node N42) is 2IRv (more exactly $(I + I_1)Rv$) and is PTAT. The voltage drop across Ry is I_1Ry. These two voltages added to V_{BE2} are the bias voltage V_{BIAS}:

$$V_{BIAS} = I_1(Ry + Rv) + IRv + V_{BE2} \qquad \text{Eq. (8)}$$

Defining W = (Ry + Rv) and V = Rv provides a convenient way to understand how the various resistor values affect the relative amount of compensation the replication transistor contributes to V_{BIAS}. The factor V determines how much weight is given to the current I, whereas the factor W determines the amount of contribution from the compensation current I_1. Using a non-zero value for Rx provides additional flexibility in controlling the amount of compensation.